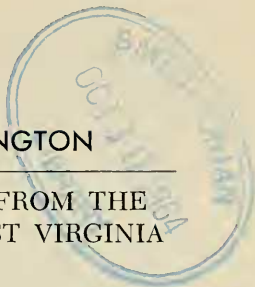


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A NEW CAVE-DWELLING CRAYFISH FROM THE
GREENBRIER DRAINAGE SYSTEM, WEST VIRGINIA
(DECAPODA, ASTACIDAE)

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The reduced size of the eyes, the white or pale color of the body, and the elongate, comparatively slender chela of this denizen of the caves in the Greenbrier drainage system distinguish it from the only other crayfish known to frequent caves in the area. Although *Cambarus b. bartonii* (Fabricius, 1798: 407) has been found in not too distant caves, the two species have been observed in the same one only in McFerrin's Water Cave (see below).

Too little is known concerning the habits and range of the new species to determine whether or not it is a member of the troglobitic fauna. In spite of the fact that all of the available specimens have been collected from caves, the presence of pigment in the eyes and in the body (except in the holotype) suggest that this crayfish is a troglophile with habits similar to those of *Cambarus tenebrosus* Hay (1902: 232) and *C. bartonii laevis* Faxon (1914: 391). Superficially, it resembles *C. tenebrosus*, *C. calni* Rhoades (1941: 146), and cave-dwelling members of *C. bartonii bartonii*, but it is suspected that its closest affinities are with *Cambarus sciotensis* Rhoades (1944: 96) and *Cambarus robustus* Girard (1852: 90).

Cambarus nerterius,¹ sp. nov.

Diagnosis: Color white, pale tan, or pale blue; eyes reduced but with pigment; rostrum with slightly convergent margins, angular or subangular at base of acumen but without spines or prominent tubercles; postorbital ridges well developed and terminating cephalically in small acute tuber-

¹ Nerterius, Gr.—underground; so named because as far as is known this species is confined to subterranean streams.

cles; suborbital angles acute; carapace with or without lateral spines or acute tubercles; areola 3.5 to 6.2 times longer than broad and constituting 37 to 40 per cent of total length of carapace; chela of male 3.3 to 3.5 times longer than greatest width, inner margin of palm with a single, non-cristiform row of tubercles, and fingers not gaping. First pleopod with terminal elements directed caudad at approximately right angles to main shaft of appendage; central projection with a subterminal notch and inflated mesial process with a small terminal projection.

Holotypic Male, Form I: Color "white" (personal communication from Miss Zotter); eyes reduced in size but with distinct pigment areas. Body subcylindrical, only slightly depressed. Abdomen narrower than thorax (21.3 and 25.7 mm in widest parts respectively). Greatest width of carapace slightly anterior to midlength of areola.

Areola moderately broad, 6.2 times longer than wide with five or six punctations across narrowest part. Cephalic section of carapace 1.4 times longer than areola; length of areola 40.4 per cent of entire length of carapace. Rostrum with slightly thickened and gently converging margins forming angles at base of moderately long acumen; upper surface slightly concave with the usual submarginal row of setiferous punctations, cephalomedian area slightly elevated but with no distinct carina; scattered setiferous punctations elsewhere. Acumen with corneous upturned tip extending cephalad slightly beyond distal margin of penultimate segment of antennule. Subrostral ridges weakly developed and scarcely evident in dorsal aspect. Postorbital ridges well defined, each with a prominent groove and terminating cephalically in acute tubercles. Suborbital angle well defined and acute. Branchiostegal spine small but acute. Surface of carapace punctate dorsally and granulate laterally, granules becoming tuberculate cephalolaterally. Usual lateral spines on carapace tuberculiform; a prominent longitudinal row of tubercles immediately ventral to cephalic portions of cervical groove.

Abdomen slightly longer than carapace (53.1 and 52.2 mm). Cephalic section of telson with two spines in sinistral corner and three in dextral.

Epistome (Fig. 6) with elevated, undulating margins and provided with cephalomedian prominence. Antennules of the usual form with a small spine on lower surface of basal segment slightly distal to midlength. Antennae broken but extending caudad to base of telson. Antennal scale (Fig. 4) moderately broad with heavy lateral portion terminating cephalically in a distinct spine; mesial margin of lamellate portion with a gently rounded contour.

Right chela (Fig. 2) distinctly elongate, subovate in cross section and with palm only slightly inflated; left chela apparently regenerated. All surfaces bearing punctations, many with short setae. Inner margin of palm with a row of nine low tubercles flanked by a row of punctations above; no other tubercles on palm except those associated with articular areas; lower distal margin of palm with the usual large tubercle at base of dactyl. Fingers not gaping and both with submedian longitudinal

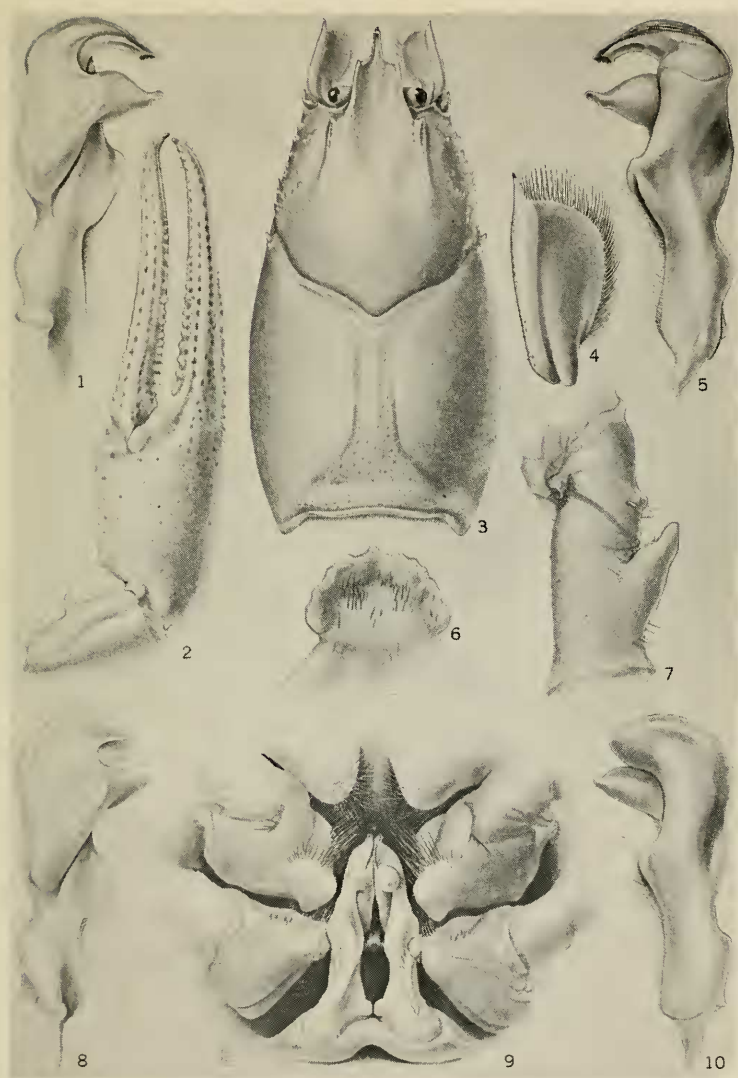


PLATE I. *Cambarus uerterius*, sp. nov. 1, Mesial view of first pleopod of holotype; 2, Distal podomeres of cheliped of holotype; 3, Dorsal view of carapace of holotype; 4, Antennal scale of holotype; 5, Lateral view of first pleopod of holotype; 6, Epistome of holotype; 7, Basipodite and ischiopodite of third pereopod of holotype; 8, Mesial view of first pleopod of morphotype; 9, Bases of fourth and fifth pereopods and first pleopods of morphotype; 10, Lateral view of first pleopod of morphotype.

elevations above and below. Opposable margin of immovable finger with two rows of tubercles—an upper row of 10 along proximal three-fifths of finger and the lower of eight along middle third of finger; tubercles of both rows diminish in size distally. Opposable margin of dactyl also with two rows of tubercles, an upper row of 18 along proximal four-fifths of finger and a lower row of five along middle third. Opposable margin of both fingers with minute denticles between and distal to aforementioned tubercles. Mesial margin of dactyl with a row of five tubercles near base.

Carpus distinctly longer than broad with an oblique furrow on upper surface; upper surface punctate. Mesial surface with a single large tubercle and a small one near proximal margin; lower surface with the usual two marginal tubercles and an additional one proximal to the more mesial of the two.

Upper distal surface of merus with three tubercles, two of which conspicuously larger than third; lateral and mesial surfaces with a few scattered punctations; lower surface with a mesial row of nine tubercles and a lateral one of three. Ischiopodite with a ventral row of four small tubercles; punctate elsewhere.

Hooks (Fig. 7) on ischiopodites of third pereopods only; hooks strong and simple; tips extending proximad of distal margin of basipodites. Caudomesial surfaces of coxopodites of fourth pereopods with prominent projections (Fig. 9); coxopodites of fifth pereopods without prominences.

First pleopods (Figs. 1, 5, 9) symmetrical and extending cephalad to coxopodites of third pereopods when abdomen is flexed. Tips terminating in two parts reflexed at angles of about 90 degrees. Mesial process non-corneous and notched near apex.

Morphotypic Male, Form II: Differs in few details from the holotype. Color pale tan above, cream below; appendages cream but pale blue basally. Rostrum with a pair of minute tubercles at base of acumen; lateral surface of carapace with several tubercles although one distinctly larger than others; antenna extending caudad to sixth abdominal segment; cephalic section of telson with only one spine in each caudolateral corner. Inner margin of palm of chela with a row of 10 tubercles; opposable margin of immovable finger with a single row of 14 tubercles and a larger one situated below row between 11th and 12th tubercles from base; opposable margin of dactyl with a single row of 15 tubercles and a single large one situated below row between 5th and 6th tubercles from base; lower mesial margin of carpus with a row of 14 tubercles. First pleopod as figured (Figs. 8, 10).

Allotypic Female: Differs from the holotype in the following respects: Color two days after preservation as in morphotype. Rostrum with a minute tubercle at sinistral base of acumen; lateral surface of carapace with strongly reduced lateral tubercles. Inner margin of palm of chela with eight tubercles; opposable margin of immovable finger with a single row of six tubercles and one below it at base of distal third of finger;

opposable margin of dactyl with a row of six tubercles; minute denticles along opposable margins of both fingers occurring in single rows; upper distal surface of merus with only two tubercles and lower mesial margin with a row of 11. Cephalic section of telson with two spines in each caudolateral corner.

Annulus ventralis much broader than long with a narrow, longitudinal, cephalomedian depression which expands near midlength of annulus into a subovate depressed area. Caudal wall not thickened or elevated (ventrally). Sinus originating sinistrally along caudal margin of depression, extends mesially and slightly cephalically just across median line where it suddenly turns caudosinistrally to cut caudal wall of annulus along median line.

Measurements: As follows, in millimeters:

	<i>Holotype</i>	<i>Allotype</i>	<i>Morphotype</i>
Carapace—			
Height	21.7	12.8	16.8
Width	25.7	15.2	19.1
Length	52.2	34.4	42.4
Rostrum—			
Width	7.5	5.7	6.2
Length	10.3	7.0	7.8
Areola—			
Width	3.5	2.3	3.1
Length	21.1	13.0	16.2
Chela—			
Length of inner margin			
of palm	14.7	6.5	8.7
Width of palm	13.0	6.5	11.1
Length of outer margin			
of hand	50.4	22.3	36.2
Length of dactyl	32.2	14.1	22.6

Type Locality: Matt's Black Cave, 2 miles south of Renick, Greenbrier County, West Virginia; about 400 feet from the entrance to the cave. Collected 1 July 1962 by Miss Hermine Zotter.

Disposition of Types: The holotypic male, form I, the allotypic female, and the morphotypic male, form II, are deposited in the U. S. National Museum (Nos. 111295, 111296, 111297, respectively). The paratypes, comprising 2 males, form II, 2 females, 2 juvenile males, and 2 juvenile females, are also in the same collection.

Specimens Examined: All of the specimens were collected in Greenbrier County, West Virginia. The holotypic male, as indicated above, was collected on 1 July 1962 by Miss Zotter; a female, a juvenile male, and a juvenile female were taken from the type locality on 17 June 1963 by Mr. John A. Stellmack. Two second form males were collected in Ludington Cave, about 5 miles north of Lewisburg and 2 miles east of

Rt. 219 by Mr. John R. Holsinger. These specimens were found in a stream about $\frac{1}{2}$ mile from the entrance of the cave. On 20 July 1963, Mr. Holsinger collected an additional female from the type locality and a second female from McFerrin's Water Cave; on 17 August 1963 he secured a first form male from General Davis Cave. A juvenile male was found by Mr. Lyle G. Conrad in McClung Cave, also about 5 miles north of Lewisburg, some 2,500 feet from the entrance and in a pool about 5 inches deep. Mr. Conrad collected one second form male, two females, and a juvenile female from McClung Cave on 12 April 1963; the three larger specimens were found some 1.5 miles from the entrance in "Chocolate Avenue"; the smaller one was found in a dry stream bed.

Relationships: *Cambarus nerterius* probably has its closest affinities with *Cambarus sciotoensis* Rhoades and *C. robustus* Girard. It differs from the former most conspicuously in lacking thickened rostral margins, and from the latter by the suddenly contracted margins at the base of the acumen. The similarities are in the comparatively broad areola with many punctations and in the conformation of the elongate chela of which the immovable finger is somewhat costate laterally and bears a depression above and below at its base. Superficial resemblance to *C. tenebrosus* Hay and *C. cahni* Rhoades are perhaps results of adaptations to similar environments.

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